Studies on Magnesioferrite

Kushima, Isao; Amanuma, Tsuyoshi; Yokota, Tetsuro

ABSTRACT

Studies on Magnesioferrite

Isao KUSHIMA, Tsuyoshi AMANUMA and Tetsuro YOKOTA

(Sawamura Laboratory)

We have studied the formation temperature and formation ratio of magoesioferrite ($MgFe_2O_4$) from the mixture of MgO and Fe_2O_3.

The equimolar mixture of oxides was pressed in the mold under about 100 kg/cm^2., and heated in air at 700°, 800°, 900°, 1000°, 1100°, 1200° and 1300° C., for various hours. These sintered samples were examined by X-ray (Debye-Scherrer method), magnetic and chmical analysis. Further the formation ratio of magnetite was studied which was derived from dissociation of Fe_2O_3 contained in the sample. The free MgO contained in sintered samples was leached in ammoniacal ammonium chloride solution.

The results were as follows:

(1) $MgFe_2O_4$ are formed by heating the mixture of MgO and Fe_2O_3 over 700° C, and the reaction is complete at 1000°C in one hour.

(2) When the sample is heated at 1200° C, the intensity of magnetization increases remarkably as compared with the sample heated at 1100°C. It can be considered that this remarkable increase of ferromagnetism is due not only to the change of ionic arrangement, but also to the formation of magnetite in the sample.

(3) The formation ratio of magnetite in sintered sample is nil at 1100°C., and about 10 % at 1200°C.

(Read at the semi-annual meeting of the Institute on November 26, 1954)